

A.2.8 SWMU 16

Description

SWMU 16 was identified based on the indicated presence of TEL burials on the Refinery Leaded Burial Map. SWMU 16 consists of a suspected 20-foot by 20-foot TEL sludge burial located in the southeast corner of Tank Basin 306 in the North Field. This SWMU is located near the NF6 LNAPL Area.

As shown on Figure A.2.6 and summarized on Table A.2.6, data from 13 soil borings, 13 soil samples, one monitoring well groundwater sample and one hydropunch sample have been used to characterize this SWMU. Data from other investigations are also included on Table A.2.6 for delineation purposes.

One boring (SB0033) was installed during the 1st-Phase Soils Investigation and the sample from this boring was analyzed for Skinner's List VOCs and SVOCs, lead and TEL to provide data for source characterization of SWMU 16. Additionally, two borings (S0804 and S0807) were installed during the full RFI, and samples from these borings were analyzed for TCL VOCs and SVOCs, TAL metals and TOL to further evaluate the location and extent of this potential leaded burial site. One of these samples was also analyzed for SPLP metals and physical characteristics.¹ Based on data from the full RFI borings, three additional borings (S1009, S1010 and S1011) were installed during the Full RFI second iteration of sampling to further delineate this SWMU. Samples from these borings were analyzed for BTEX, PAHs, lead, arsenic, copper and TOL.

Soils

The following table summarizes the number of samples where soil delineation criteria were exceeded within SWMU 16:

Constituents of Concern	Surface Soils (0 to 2 ft) (3 Samples)	Fill Material (>2 ft) (7 Samples)	Native Soils (3 Samples)	Totals (13 Samples)
Benzene	0/3	5/7	2/3	7/13
Other VOCs	0/3	2/7	0/3	2/13
Benzo(a)pyrene	0/3	2/7	0/3	2/13
Other SVOCs	0/3	3/7	0/3	3/13
Lead	0/3	1/7	0/3	1/13
Other TAL metals ^a	0/2	2/2	1/2	3/6
TOL/TEL	0/3	4/7	0/3	4/13

^aTotals do not include naturally-occurring metal compounds in excess of the delineation criteria (Al, Ca, Fe, Mg, Mn, K and Na).

¹Physical characteristics specified in Appendix A, Task IV of Module III of the HWSA Permit included saturated and unsaturated permeability tests, moisture content, relative permeability, bulk density, porosity, soil sorptive capacity, CEC, TOC, pH, Eh and grain size distribution.

Surface Soils (0 to 2 feet bgs)

Only one of the three surface soil samples (S1010A4) collected within this SWMU exhibited evidence of a petroleum odor. However, none of the three surface soil samples contained exceedances of COCs.

Fill Materials (>2 feet bgs)

Evidence of staining and odor were present in all seven samples collected from the fill layer within this SWMU. The highest PID readings (ranging from 188 to 3,524 ppm) recorded at each boring within SWMU 16 occurred within the fill layer unit. In addition, other evidence of soil impacts including catalyst beads, slag, black sludge material and/or residual LNAPL was observed in all of the fill samples. The residual NAPL observed in these borings may be associated with the NF6 LNAPL Area.

Six of the seven samples collected from the fill layer within SWMU 16 contained exceedances of the soil delineation criteria. Lead and/or TOL were detected in four of the seven fill samples. Benzene was detected in six of the samples; however, one of the samples (S1011D4) had a low concentration of benzene (1.2 mg/kg). As this sample was collected below the water table, the IGWSCC is not applicable at this location, and the concentration did not exceed the RDCSCC of 3 mg/kg. Two of the samples contained at least one other VOC (e.g., ethylbenzene and/or xylene), three of the six samples also contained PAHs, and two of the samples also contained copper and arsenic above soil delineation criteria. Arsenic concentrations, ranging from 62 to 78.2 mg/kg, are within the normal range for soils, particularly glauconitic soils in the Coastal Plain (Saunders, 2003). Benzene and/or benzo(a)pyrene was also detected in all samples where organic compounds were detected above applicable soil delineation criteria.

The SPLP sample (S0804D2) contained 1.6 mg/L of antimony, exceeding the applicable criterion for SPLP antimony (0.22 mg/L)². No other metals were detected above applicable SPLP criteria in this sample, and no metals were detected above applicable soil delineation criteria in the accompanying sample (S0804D2) that was analyzed for total metals. Therefore, the soils are not a source of metal impacts to groundwater.

Native Material

Only one of the three samples collected from within the native soils layer within SWMU 16 exhibited evidence of staining (S1010D4). Two of the three samples (S1010D4 and S0804E4) contained exceedances of the soil delineation criteria. Benzene was detected in both of those samples above the soil delineation criterion. Arsenic (25 mg/kg) was detected in one sample (S0804E4), which is well within the normal range for soils, particularly glauconitic soils in the Coastal Plain (Saunders, 2003). The third sample from the native soil layer contained no exceedances of the soil delineation criteria, except for naturally-occurring iron.

²Based on the groundwater criterion for antimony (20 µg/L), DAF = 11.

As discussed further in Section 6 of the RFI Report, lateral delineation of selected COCs has been completed on a site-wide basis for each Yard. The delineation of these COCs is depicted graphically on the figures provided in Section 6.

Groundwater

Benzene (800 µg/L) was detected above groundwater delineation criteria in a recent groundwater sample from monitoring well MW-125. A more detailed discussion of potential groundwater impacts in the vicinity of SWMU 18 can be found in Section 8 of the RFI Report.

Summary

A number of COCs, including but not limited to benzene, benzo(a)pyrene, lead, TOL/TEL, arsenic and copper have been detected above the soil delineation criteria in a number of soil samples collected from within this SWMU. Several of these constituents, especially lead and TOL/TEL, are consistent with those expected to be associated with the burial of gasoline tank bottom materials. In addition, the depth (at or near the fill/native soil interface) at which these constituents were detected in soils is consistent with waste management practices believed to have been conducted in this area. Therefore, SWMU 16 is believed to be a TEL burial site, and will be included for further evaluation in the CMS.

The groundwater sample collected from within SWMU 16 contained benzene above the groundwater delineation criterion; therefore the groundwater in the vicinity of SWMU 16 will be further evaluated in the CMS.